CLAIMS: *Please amend the claims according to the status designations in the following list, which contains all claims that were ever in the application, with the text of all active claims.*

1. – 16. (CANCELED)

17. (NEW) A method for visually tracking a target object in three dimensions, comprising steps of:

a) capturing the target object with two or more imaging sensors,

b) maintaining a large number of 3D target location hypotheses,

c) projecting each target location hypothesis from 3D space to 2D image spaces of said imaging sensors,

d) measuring confidences about the presence of the target object in images captured by said imaging sensors, and

e) combining the measured confidences of the hypotheses to obtain 3D location of the target object,

wherein the final target object location is given by the weighted mean of all location hypotheses of said 3D target location hypotheses for combining the measurements, and

whereby examples of said target object can comprise human appendage, human hand, and human head.

18. (NEW) The method according to claim 17, wherein the method further comprises a step of projecting target locations with projections that are obtained by calibrating said imaging sensors with respect to a reference coordinate system.

19. (NEW) The method according to claim 17, wherein the method further comprises a step of measuring overall confidence of the target object location based on a combination of a plurality of confidence images from each of the imaging sensors,

wherein the target object location is given as the central location of the confidences region.

20. (NEW) The method according to claim 17, wherein the method further comprises a step of measuring said confidences based on a combination of color and motion cues in each of the images captured by said imaging sensors,

wherein the color and motion cues are spatially spread out using averaging before they are combined, and

whereby the combination of the spread out images results in an image where a combined response is not only present at some of the edges of the target object but also contains strong responses in the interior of the target object.

21. (NEW) The method according to claim 20, wherein the method further comprises a step of calculating the color cues using a color model of the target object,

wherein the color model of the target object is represented by a histogram that is estimated by collecting color samples of the target object.

22. (NEW) The method according to claim 20, wherein the method further comprises a step of calculating motion cues by measuring differences between images captured sequentially by said imaging sensors.

23. (NEW) The method according to claim 17, wherein the method further comprises a step of maintaining 3D target location hypothesis by creating a set of 3D target location hypotheses at each time step,

wherein the weights of the new hypotheses are given by said confidences.

24. (NEW) The method according to claim 23, wherein the method further comprises a step of creating said 3D target location hypotheses based on known 3D target location hypotheses from a previous time step.

25. (NEW) The method according to claim 23, wherein the method further comprises a step of initially distributing the 3D target location hypotheses randomly in the space viewed by said imaging sensors.

26. (NEW) The method according to claim 17, wherein the method further comprises a step of adding random displacements to the location hypothesis at each time step for maintaining 3D target location hypotheses.

27. (NEW) An apparatus for visually tracking a target object in three dimensions, comprising:

a) means for capturing the target object with two or more imaging sensors,

b) means for maintaining a large number of 3D target location hypotheses,

c) means for projecting each target location hypothesis from 3D space to 2D image spaces of said imaging sensors,

d) means for measuring confidences about the presence of the target object in images captured by said imaging sensors, and

e) means for combining the measured confidences of the hypotheses to obtain 3D location of the target object,

wherein the final target object location is given by the weighted mean of all location hypotheses of said 3D target location hypotheses for combining the measurements,

whereby examples of said target object can comprise human appendage, human hand, and human head, and

whereby examples of the imaging sensors can comprise color cameras and IEEE 1394 cameras.

28. (NEW) The apparatus according to claim 27, wherein the apparatus further comprises means for projecting target locations with projections that are obtained by calibrating said imaging sensors with respect to a reference coordinate system.

29. (NEW) The apparatus according to claim 27, wherein the apparatus further comprises means for measuring overall confidence of the target object location based on a combination of a plurality of confidence images from each of the imaging sensors,

wherein the target object location is given as the central location of the confidences region.

30. (NEW) The apparatus according to claim 27, wherein the apparatus further comprises means for measuring said confidences based on a combination of color and motion cues in each of the images captured by said imaging sensors,

wherein the color and motion cues are spatially spread out using averaging before they are combined, and

whereby the combination of the spread out images results in an image where a combined response is not only present at some of the edges of the target object but also contains strong responses in the interior of the target object.

31. (NEW) The apparatus according to claim 30, wherein the apparatus further comprises means for calculating the color cues using a color model of the target object,

wherein the color model of the target object is represented by a histogram that is estimated by collecting color samples of the target object.

32. (NEW) The apparatus according to claim 30, wherein the apparatus further comprises means for calculating motion cues by measuring differences between images captured sequentially by said imaging sensors.

33. (NEW) The apparatus according to claim 27, wherein the apparatus further comprises means for maintaining 3D target location hypothesis by creating a set of 3D target location hypotheses at each time step,

wherein the weights of the new hypotheses are given by said confidences.

34. (NEW) The apparatus according to claim 33, wherein the apparatus further comprises means for creating said 3D target location hypotheses based on known 3D target location hypotheses from a previous time step.

35. (NEW) The apparatus according to claim 33, wherein the apparatus further comprises means for initially distributing the 3D target location hypotheses randomly in the space viewed by said imaging sensors.

36. (NEW) The apparatus according to claim 27, wherein the apparatus further comprises means for adding random displacements to the location hypothesis at each time step for maintaining 3D target location hypotheses.